Tapping into Water Movement

PN00-0022-01-21

The Advanced Tensiometer takes continuous readings of soil tension 100 to 200 feet below land surface.

Advanced Tensiometer

Project managers needed to measure the seasonal variation of soil moisture in the Big Lost River Area as part of their Remedial Investigation/ Feasibility Study for Waste Area Group 3 at the Idaho Nuclear Technology and Engineering Center. Because the water table in this area rises and drops throughout the year, they needed an instrument that would take continuous readings of soil water tension in varying temperatures. The **Advanced Tensiometer** was the reliable tool of choice since it measures soil water potential—an indication of how tightly soil holds water. To deploy the instrument, a hole is drilled where soil water potential is going to be measured. The tensiometer is then lowered into the borehole to the desired depth. Once in the ground, water pressure inside the tensiometer equalizes with the water pressure in the

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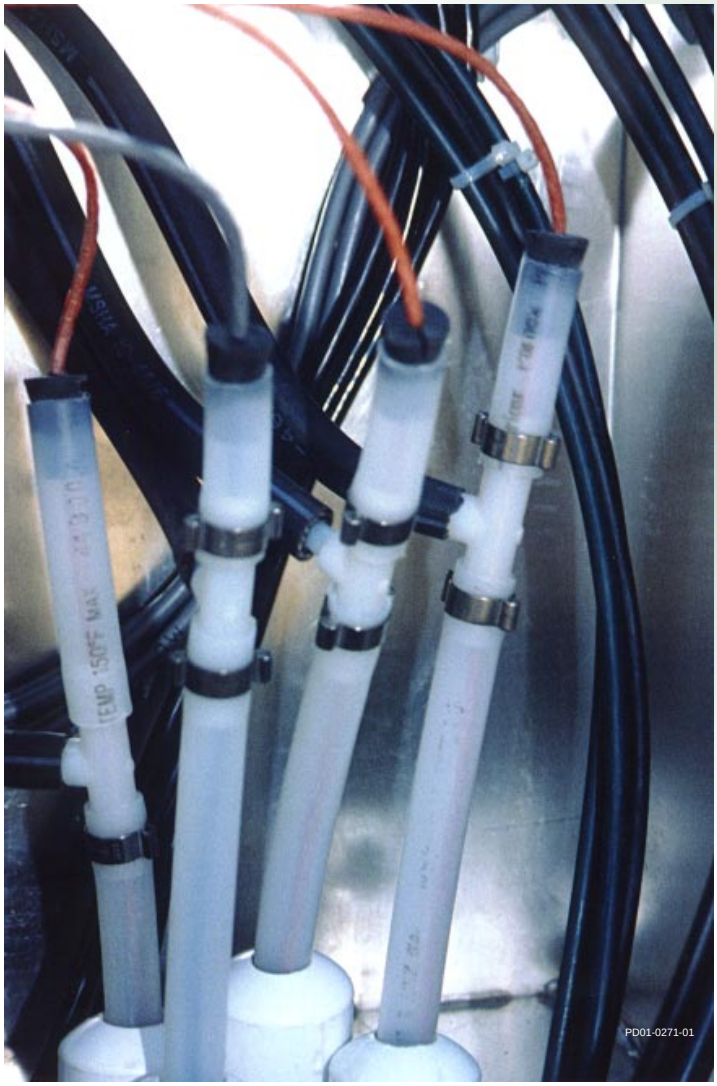
surrounding soil. Readings of pressure changes are transmitted to a data logger at the surface. While conventional tensiometers are limited to depths of 10 feet, the **Advanced Tensiometer** has been installed at depths of two to 500 feet. The design of the tensiometer is simple, low cost, and requires very little maintenance. It has two main parts: a porous cup with a water reservoir and guide tube, and a removable pressure transducer. There are no moving parts and electronic components are serviceable from the surface. The instrument can be continuously operated over a long period of time and is largely unaffected by temperature change. In FY 2001 this instrument was used to improve the reliability of soil water potential measurement in deep underground soils.

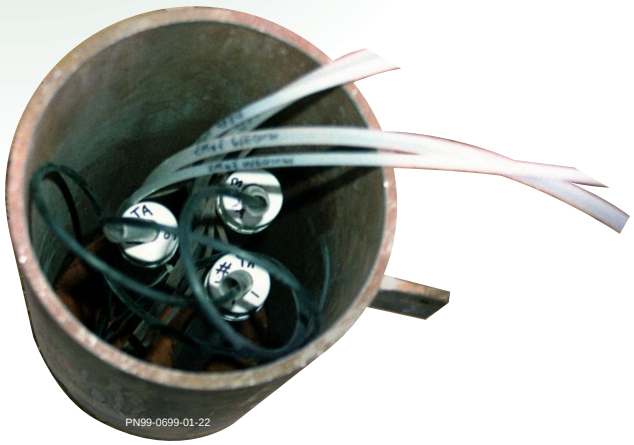
The Advanced Tensiometer has been installed at depths of two to 500 feet.



Four Advanced Tensiometers gathering data and sending it through wires to a vadose zone monitoring system.

Benefits:

- Detects early potential for groundwater contamination at any depth—increasing intervention time
- Detects potential contaminant pathways through the subsurface
- Demonstrates the effectiveness of landfill covers, performs cost-effective long-term monitoring
- Enables the collection of data required to calibrate subsurface contaminant migration models



Advanced Tensiometers are lowered into a well casing inside a borehole